

# **Marine Physical Laboratory**



Near Bottom Data Collection and Data Analysis

W. S. Hodgkiss

Final Report to the Office of Naval Research Contract N00014-89-D-0142 (DO#14) for the Period 07-01-90 - 03-30-92



MPL-U-25/93 May 1993

Approved for public release; distribution unlimited.



University of California, San Diego Scripps Institution of Oceanography

90 6 10 012

93-13588

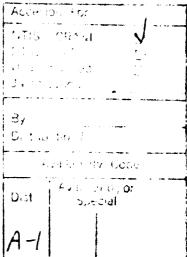
REPORT DOCUMENTATION PAGE					Form Approved OMB No. 0704-0188	
Public reporting burden for this collection gathering and maintaining the data near this collection of information, including to David Mathematics, Stille 1204, Adjustion M.	cf information id ed, and con uggestions for a 22202-4302	is estimated to average 1 pletting and reviewing the reducing this burden, to W and in the Office of Maner	hour per respons collection of infor ashington Heads persent and Buck	ie, including the time for reviewing matter. Send comments reparding warters Services, Directorate for intent. Persent if	mitricitors, searching distalling data sources, this burden estimate or any other aspect of ormation Operations and Reports, 1215 Jefferson 1704-01881, Management, DC 9760-0	
1. Agency Use Only (Leave B	highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Peperwork Reduction Pro- licy Use Only (Leave Blank).  2. Report Date. May 1993  3. Report Type and Final					
4. Title and Subtitle.			· · · · · · · · · · · · · · · · · · ·	<u> </u>	5. Funding Numbers.	
NEAR BOTTOM DATA COLLECTION AND ANALYSIS					N00014-89-D-0142 (DO#14)	
6. Author(s). W. S. Hodgkiss					Project No. Task No.	
7. Performing Monitoring Agency Names(s) and Address(es).					8. Performing Organization Report Number.	
University of California, San Diego Marine Physical Laboratory Scripps Institution of Oceanography San Diego, California 92152					MPL-U-25/93	
9. Sponsoring/Monitoring Agency Name(s) and Address(es).					10. Sponsoring/Monitoring Agency Report Number.	
Office of Naval Research Department of the Navy 800 North Quincy Street Arlington, VA 22217-5000					Report number.	
11. Supplementary Notes.						
12a. Distribution/Availability Statement.					12b. Distribution Code.	
Approved for public release; distribution is unlimited.						
13. Abstract (Maximum 200	words).					
The objective of required to cond	this prouct a VI	gram was to as F noise and si	ssist NOS gnal expe	C in the preparation riment in FY93.	ns	
14. Subject Terms.					15. Number of Pages.	
very low frequency noise, multidimensional array systems, signal processing					16. Price Code.	
or Heport.	of This Page. of A			rity Classification stract.	20. Limitation of Abstract.	
Unclassified	Unc	lassified		Unclassified	None	

# Near Bottom Data Collection and

**Data Analysis** 

W. S. Hodgkiss

Final Report to the Office of Naval Research Contract N00014-89-D-0142 (DO#14) for the Period 07-01-90 - 03-30-92



### Abstract

The objective of this program was to assist NOSC in the preparations required to conduct a VLF noise and signal experiment in FY93.

# Project Summary

Little experimental data exists which can be applied to the design and performance evaluation of of multidimensional array systems. Such data are needed both to validate signal and noise propagation models as well as to provide well-documented real data inputs to new adaptive spatial and temporal processing algorithms.

The experiment to be conducted in FY93 will provide a multidimensional array data set along with detailed environmental data including water column sound speed structure and geoacoustic characterization of the bottom. Preparations for the FY93 experiment have involved several efforts.

First, MPL has assisted NOSC in planning the FY93 experiment. This has included planning the shipboard handling of several array nodes, telemetry between nodes, and telemetry between the seafloor and ship.

#### References

Second, in order to obtain an example of near-seafloor vertical array data, the NOBS (noise on basalt and sediment) experiment was augmented with 48 hydrophone array elements providing data on ambient noise and signal structure from the sea floor to approximately 750 m above. Analysis of this data is documented in [1].

Third, robust adaptive algorithms have been developed for the processing of multidimensional array data. Uncertainties in the propagation environment (e.g. sound speed structure) can lead to degradations in the performance of adaptive beamformers. Incorporating knowledge of this uncertainty can improve substantially adaptive beamformer performance. One approach to the design of such a robust processor in a matched-field framework is documented in [2].

## References

- [1] M.T. Hagerty, G.L. D'Spain, and W.S. Hodgkiss, "Preliminary analysis of the FLIP Array Data from the NOBS Experiment," MPL TM-429, Marine Physical Laboratory of the Scripps Institution of Ocean-ography, San Diego, CA (1992).
- [2] J. Krolik, "Matched-field minimum variance beamforming in a random ocean channel," J. Acoust. Soc. Am. 92: 1408-1419 (1992).

### **ONR/MPL REPORT DISTRIBUTION**

Office of Naval Research
Department of the Navy
Ballston Tower One
800 North Quincy Street
Arlington, VA 22217-5860
Atten: Code ONT 23D

Administrative Grants Officer (1)
Office of Naval Research
Resident Representative
University of California, San Diego, 0234
8603 La Jolla Shores Drive
San Diego, CA 92093-0234

Commanding Officer (1)
Naval Research Laboratory
Atten: Code 2627
Washington, D.C. 20375-5320

Defense Technical Information Center (4) Building 5, Cameron Station Alexandria, VA 22304-8145